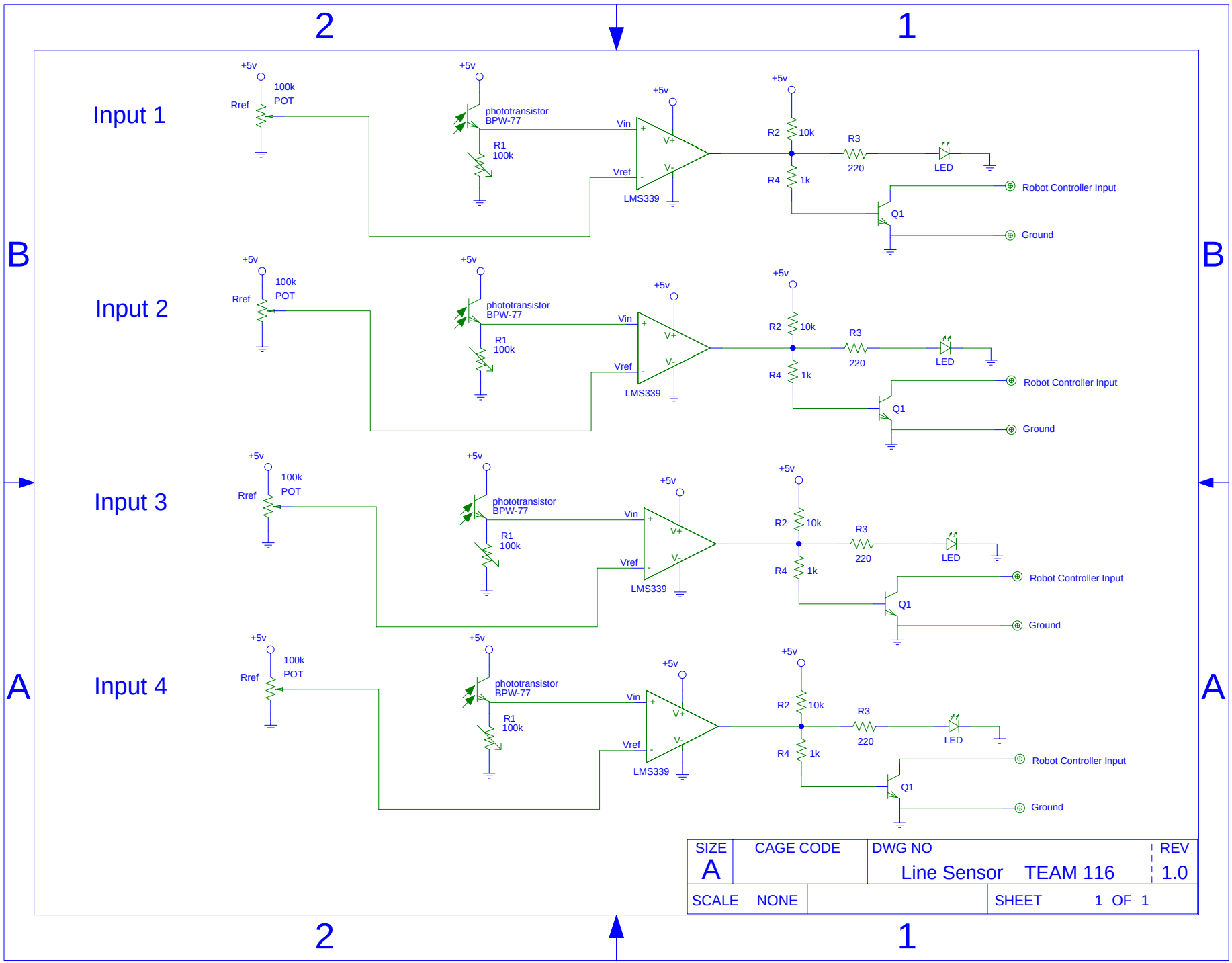
LINE SENSOR

HERNDON HIGH SCHOOL/NASA HQ

TEAM 116

2003


2
1
B
A
Input 1
Input 2
Input 3
Input 4
+5v
100k
POT
Rref
phototransistor
BPW-77
R1
100k
Vin
Vref
V+
V-
LMS339
R2
10k
R3
220
R4
1k
LED
Q1
Robot Controller Input
Ground
SIZE
A
CAGE CODE
DWG NO
Line Sensor TEAM 116
REV
1.0
SCALE NONE
SHEET 1 OF 1

DESCRIPTION

The line sensor array consists of four visible light phototransistors and five high-intensity yellow LEDs. The phototransistors measure the relative brightness of the floor, where lighter colors correspond to higher voltage across R1. The threshold is set by potentiometer R_{REF}. When V_{IN} is greater than V_{REF}, the comparator is in a high impedance state and the output is pulled-up to 5V by R2. When V_{IN} is less than V_{REF} he comparator output is shorted to ground.

R3 and the LED provide feedback. When the sensor output is higher than V_{REF} the LED is on.

Transistor Q1 is used as an open-collector switch to interface with the robot controller.

All four sensing circuits share a common reference voltage, V_{REF}.